The Surgical Role of Family Physicians

MICHAEL W. MAINEN, MD

Abstract: A sample of Board-certified family physicians was surveyed regarding their role in providing operative surgical care. Twenty-one per cent reported operating and 40 per cent assisting at surgery. The percentage operating was 10 per cent in the East and 29 per cent in the West, while assisting was 22 per cent in the East and 57 per cent in the West. The frequency with which family doctors functioned as surgical operators was found to be inversely related to the perceived number of surgeons practicing in the local community, ranging from 16 per cent in communities where respondents perceived many surgeons to 56 per cent in communities with no surgeons. An interaction effect between geography and the relative number of surgeons in the local community appeared to influence whether the family physician functioned as operator or assistant. There was no independent relationship between community population size and operating by family physicians. The study suggests that the surgical role of the family physician develops in response to his local practice setting, and that the role cannot be defined from data averaged on a national scale. (*Am J Public Health* 1982; 72:1359–1363.)

Introduction

Surgery in the United States continues to be delivered both by family physicians and by board-certified surgeons. Nationally averaged data indicate that family physicians constitute about one-fourth of the surgical work force, although they perform less than 10 per cent of the California Relative Value (CRV) weighted surgical work load.[1,2] The appropriateness and necessity of family physicians performing operations has been questioned, and it has been suggested that the nation's cohort of board-certified surgeons is sufficient to provide all surgical health care services in this country.[3] Such suggestions fail to consider the wide diversity of health care patterns that reflect geographic factors and manpower resources.

Few published studies in the United States have addressed the surgical roles of family physicians directly or considered local factors which influence those roles. In one such study, Sundwall and Hansen observed that hospital administrators in the Intermountain states reported a significantly greater likelihood that family physicians would be granted surgical privileges than did administrators from New England states,[4] while Folse, *et al,* noted that the average surgical work load of family physicians in their central and southern Illinois study area[5] was comparable to the national averages reported in the Study on Surgical Service for the United States.[6]

Stern, *et al,* have reported that residency trained board-certified family physicians from west of the Mississippi were substantially more likely to have surgical privileges than their colleagues from the East.[7]

This study reports the rates at which family physicians are actively involved in operative surgical care in different practice settings. The relationships of the community's population size, its geographic region, and the presence of general surgeons to the surgical role of the family physician are examined. The objective is to discover if there are consistent patterns in these relationships.

Methods

The physicians studied were a national sample drawn from a listing of all 1976 diplomates of the American Board of Family Practice. A systematic sample of 1,078 names was obtained by taking alternate names from an alphabetical state-by-state listing.

In 1980 the sample was surveyed by mail, and 787 physicians (73 per cent) responded either to the initial survey or to the one follow-up letter. By eliminating those respondents who were not currently in practice, those who were not doing family practice (e.g., working in student health services, emergency rooms, etc.), and those who were in family practice but did not have and use hospital privileges, we derived a study sample of 667 physicians. Also excluded were those few respondents who volunteered information that they had been formally trained in general surgery (this question was absent from the survey). The rates of surgical activity were derived from these 667 respondents, 62 per cent of the original sample.

To maximize the reliability of the survey format, the questions were made multiple choice and the answers categorical and as near to mutually exclusive as possible. In order to determine the surgical manpower composition of

Address reprint requests to Michael W. Mainen, MD, Department of Family Practice, Eastern Maine Medical Center, Bangor, ME 04401. This paper, submitted to the Journal November 25, 1981, was revised and accepted for publication March 30, 1982.

their community, we asked survey respondents to choose the statement which most closely described their practice situation from among these three choices:

1. There are *many* general surgeons and surgical specialists who practice in my hospital *and* reside in or quite near my community.
2. Only a *few* general surgeons practice in my hospital *and* reside in or quite near my community. Most of the physicians are primary care providers.
3. *No* surgeons practice in my hospital *and* reside in or quite near my community. All of the physicians are family physicians or other primary care providers.

To assess their involvement in operative surgery, we asked respondents to choose from three characterizations of their surgical activity:

1. I perform some major surgery. (For the purposes of this survey, major surgery would include cases which have at least the complexity of a herniorrhaphy, appendectomy, tubal ligation, tonsillectomy, etc.)
2. I do not ordinarily participate in operating room surgical cases.
3. I commonly assist at major surgery but do not perform major operations myself. I may do minor OR procedures such as D & C or breast biopsy.

Where a respondent qualified his answer, every effort was made to tabulate it as an accurate reflection of his practice pattern, including further communication with the respondent if necessary.

Results

The 50 states were divided into East, Central, and Western regions.* Regional distribution of respondents was 35 per cent from the East, 40 per cent from Central, and 25 per cent from the West. The towns and cities in which the respondents practiced were grouped into four categories by population size, distributed as follows: less than 5,000—19 per cent; 5,000–30,000—36 per cent; 30,000–100,000—23 per cent; and more than 100,000—22 per cent.

Surgical Activity

Operating was reported by 21 per cent of the respondents, assisting by 40 per cent, and no involvement in operating room surgical care (designated "no OR") by 39 per cent.

Significant regional differences are evident in the rates at which family physicians operate, as illustrated in Figure 1. Operating was reported a part of their practice by only 10 per cent of family doctors from Eastern communities but by 29 per cent of Western family physicians, surgical assisting by 22 per cent in the East and 57 per cent in the West. These

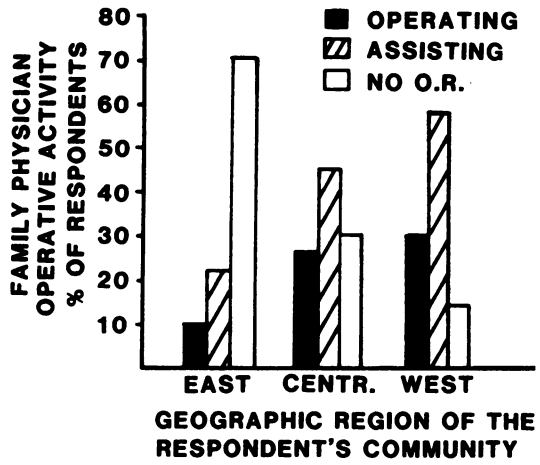

FIGURE 1—Percentage of Family Physicians Who Report Operating, Assisting at Surgery, or Having No Operative Care Involvement in East (n = 229), Central (n = 262), and western regions (n = 177)

regional differences are statistically significant both for operating ($X^2 = 28.7$; $P < .0001$) and assisting ($X^2 = 52.9$; $P < .0001$). Figure 2 illustrates that as the perceived number of surgeons declines, there is a substantial increase in the per cent of family physicians who report operating ($X^2 = 42.3$; $P < .0001$), starting at 16 per cent in communities with many surgeons and rising to 56 per cent in towns with no surgeons. The distribution of those who report assisting at surgery follows an inverted-V pattern, peaking at 50 per cent in communities with only a few surgeons while lower in those with many or those with no surgeons ($X^2 = 42.0$; $P < .0001$).

There is a statistically significant inverse relationship between population size of a community and the frequency with which family physicians from such communities report operating. However, since community population was noted to be directly correlated with number of surgeons in the

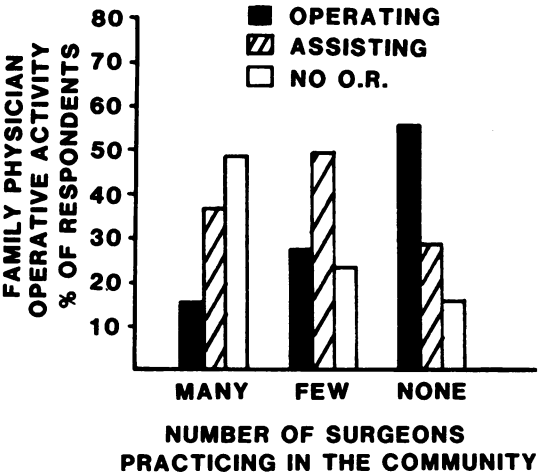

FIGURE 2—Percentage of Family Physicians Who Report Operating, Assisting at Surgery, or Having No Involvement in Operative Care in Communities Where There Are Many Surgeons (n = 436), Few Surgeons (n = 189), or No Surgeons (n = 43)

*Eastern division included New York, Pennsylvania, West Virginia, Kentucky, Tennessee, Alabama, and all states to the east of these. The Western division included Montana, Wyoming, Colorado, New Mexico, and all states to the west of these, including Alaska and Hawaii. The Central division included the remainder of the states.

community (Pearson coefficient of correlation, r = 0.57; n = 670; P < .005), and the number of surgeons is inversely related to the frequency of operating by family physicians (Figure 2), it is necessary to control for this correlation. Respondents were grouped according to number of surgeons in their community (many, few, or none), and surgical activity within each group was then examined in relation to population size within the group. Thus controlled, no statistically significant relationship is seen between population size and surgical activity by family physicians (Figure 3).

Interaction Effect of Region and Number of Surgeons

Geographic region and number of surgeons in the community are not totally independent of one another, as there are geographic differences in the proportion of communities with many, few, or no surgeons. Figures 4 and 5 examine the independence of these factors and their interaction.

In Figure 4, surgical activity of family physicians is plotted with respect to the number of surgeons in the community for each of the three geographic regions. This relationship between surgeons and family physician surgical activity is statistically significant in all three regions (East-X^2 = 41.1, P < .0001; Central-X^2 = 28.5, P < .0001; West-X^2 = 12.1, P < .02). The Figure further illustrates an interaction effect between region and number of surgeons.

In Central and Western communities (Figure 4), fewer surgeons are associated with a substantially increased percentage of family doctors who operate, whereas in Eastern communities there is only a modest increase. Family physician surgical assisting is directly proportional to number of surgeons in the West, but not in the Central and Eastern States. Figure 4 suggests that the primary response of family doctors to a drop in number of surgeons in the East is to become actively involved as assistants, while the response in the Western states is to become the operators, and the Central states fall between these extremes.

These interaction effects between region and surgeons in the community can be viewed from a different perspective if the communities are grouped by perceived number of surgeons, and operative activity is plotted with respect to geographic region within each group (Figure 5). In communities with many surgeons, the greatest regional difference in the surgical role of family physicians lies in the rate of surgical assisting. In communities with only a few surgeons, assisting is virtually unchanged from East to West, while operating increases from East to Central but not from Central to West. In communities with no surgeons, assisting is again essentially constant across the nation, while operating increases substantially from East to Central and slightly from Central to West.

Discussion

The population chosen for study was a subset of family physicians, board-certified in 1976. This group can not be considered representative of the nation's general practitioners, nor is it representative of the 52,000 members of the American Academy of Family Physicians, less than half of whom are also board-certified. Nevertheless, the national trend toward board certification in family medicine is clear, and the subset surveyed in this study is believed to be representative of the future population of family physicians. The stability of the practice settings of the respondents at the time of the survey may be gauged by the observation that in a follow-up study in 1982, 42 of 43 physicians sampled were still in practice at the same hospital as in 1980.

The data were obtained by subjective responses to specific questions, and they may include errors of misperception and misstatement by the respondents. The study was designed to maximize the response rate. All that was required of the respondents was to choose among mutually exclusive alternatives. In the 43-respondent follow-up study,

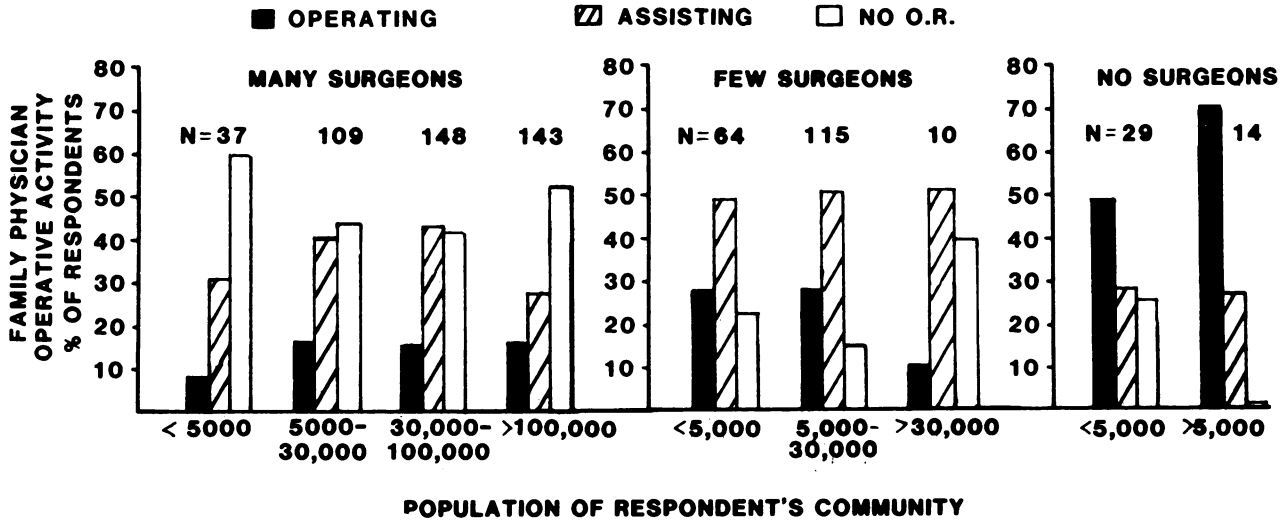

FIGURE 3—Percentage of Responding Family Physicians Who Report Operating, Assisting at Surgery, or Having No Involvement in Operative Care as a Function of the Size of the Population of the Respondent Physician's Community, when Controlled for Relative Number of Surgeons in the Community

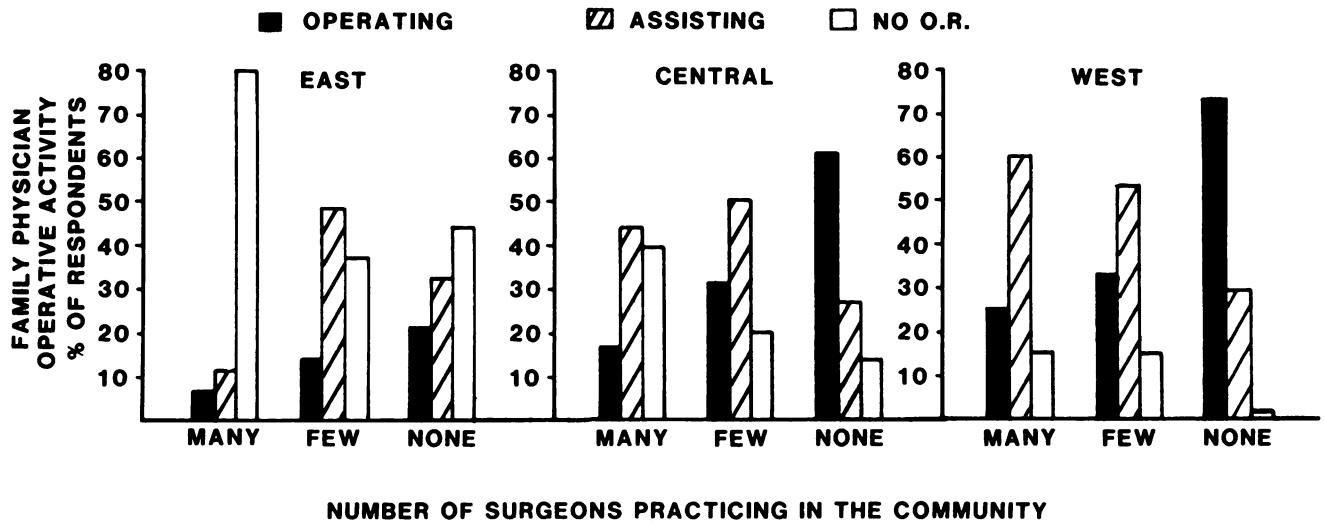

FIGURE 4—Relationship of the Number of Surgeons in a Community to the Surgical Activity of the Community's Family Physician Depends on the Geographic Location

there was only one failure to confirm operating status; and the actual number of surgeons agreed well with survey reporting of "many" and "few" surgeons.

The scope of family practice can be expanded to include operative surgery or contracted to exclude it. This study suggests that there are factors outside of the personal inclinations of the practitioner that influence the range of his/her practice; these include location of the practice and the presence and relative number of surgeons in the hospital and community. The observation that community population size per se does not appear to influence whether or not the family physician operates was unexpected. Factors that influence the character of the family physician's role warrant further study.

It is worth noting that where family physicians operate, the data reported by Moore[1] and Folse, *et al*,[5] indicate that they limit themselves to less complicated procedures. The quality of care that family physicians bring to these less complicated procedures is largely unknown, as few such studies have been reported. In 1979, Roos compared surgical outcome of tonsillectomies and adenotonsillectomies performed by general surgeons and general practitioners; she found no significant differences in complication rate or other outcome data.[8] Additional studies addressing surgical outcome as a function of the training, experience, and certification status of the surgical provider would fill a substantial information gap.

In summary, one may conclude that board-certified family physicians are involved in operative care with increasing frequency from East to West, and with increasing frequency as the number of surgeons in the community declines. There is an interaction effect between these factors that appears to influence the family physician's choice of functioning as operator or assistant. The community population size per se does not correlate with family physician surgical activity.

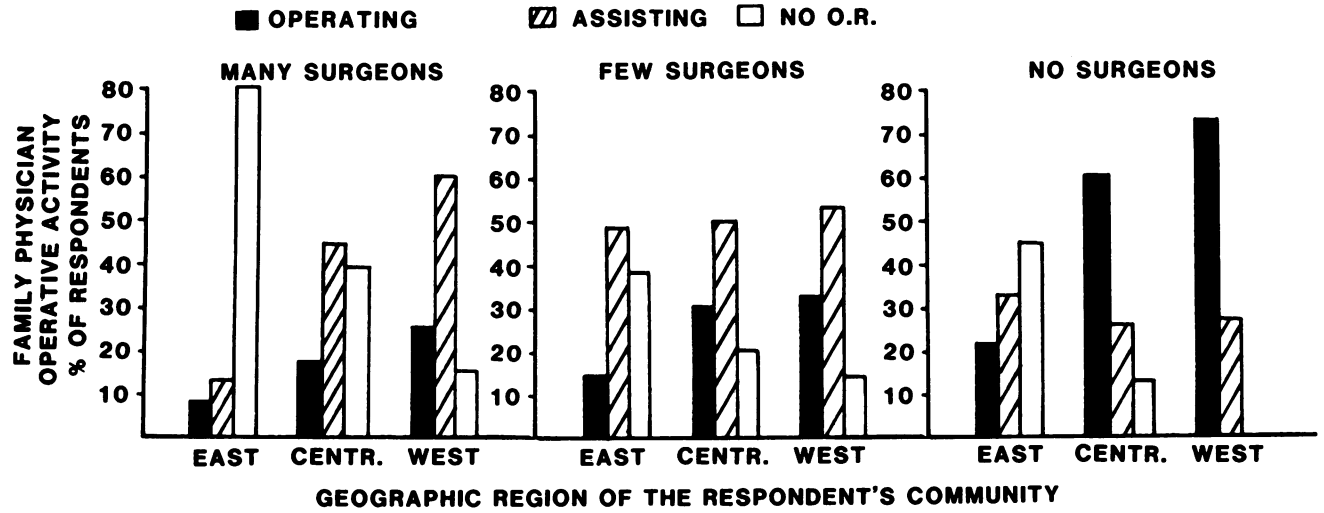

FIGURE 5—Geographic Variation in the Surgical Activity of Family Physicians Depends on the Relative Number of Surgeons in the Communities Considered

REFERENCES

1. Moore FD, Nickerson RJ, Colton T, *et al:* National surgical work patterns as a basis for residency training plans. Arch Surgery 1977; 112:125–147.
2. Nickerson RJ, Colton T, Peterson OL, Bloom BS, Hauck WW: Doctors who perform operations. N Engl J Med 1976; 295:921–926.
3. Moore FD: Manpower goals in American Surgery. Annals of Surgery 1976; 184:125–144.
4. Sundwall DN, Hansen DV: Hospital privileges for family physicians: a comparative study between the New England states and the intermountain states. J Family Practice 1979; 9:885–894.
5. Folse R, D'Elia G, Birtch AG, Metzmaker CO, Stauffer ES, Zook EG: Surgical manpower and practice patterns in a nonmetropolitan area. Surgery 1980; 87:95–100.
6. American College of Surgeons and American Surgical Association: Surgery in the United States: A Summary Report of the Study on Surgical Services for the United States, 1975.
7. Stern TL, Schmittling MS, Clinton C, Black RR: Hospital privileges for graduates of family practice residency programs. J Family Practice 1981; 13:1013–1020.
8. Roos NP: Who should do the surgery? tonsillectomy-adenoidectomy in one Canadian Province. Inquiry 1979; 16:73–83.

ACKNOWLEDGMENTS

I am indebted to Deborah A. O'Mally and Cindy A. Rice of the Department of Family and Community Medicine, University of Massachusetts, for their assistance in the distribution of survey material and the statistical analysis of data; and to Margaret P. Robinson for her most patient manuscript preparation.

Research supported in part by a USPHS faculty development grant (1-D15-PG-5100-01) through the University of Massachusetts, Department of Family and Community Medicine.

Sixth Annual Beckman Conference in Clinical Chemistry

"The Brain, Biochemistry and Behavior" is the theme of the sixth annual Arnold O. Beckman Conference in Clinical Chemistry, to be held January 10–12, 1983 in Tarpon Springs, Florida.

Sponsored by the American Association for Clinical Chemistry and supported by a grant from Dr. Arnold O. Beckman, founder of Beckman Instruments Co., the conference will examine the progress made recently in diagnosing and treating mental illness with the help of the clinical laboratory.

Chairman of the 1983 conference is Robert Habig, PhD, Assistant Professor of Clinical Biochemistry at Duke University School of Medicine, and Associate Director of Duke Hospital Laboratories.

For further information, contact Marjorie Hack, Public Information Director, American Association for Clinical Chemistry, 355 St. Paul's Avenue, Staten Island, NY 10304. Telephone 212/981-0115.